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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,592	09/28/2006	Pierluigi Oresti	296853US6X PCT	5570
22850	7590	11/24/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
SHUMATE, ANTHONY R				
ART UNIT		PAPER NUMBER		
1797				
NOTIFICATION DATE		DELIVERY MODE		
11/24/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/594,592

**Applicant(s)**

ORESTI ET AL.

**Examiner**

ANTHONY SHUMATE

**Art Unit**

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 September 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 15-28 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 15-28 is/are rejected.  
7) ☒ Claim(s) 21 and 22 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 28 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB/003)  
Paper No(s)/Mail Date 28 September 2006  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Summary***

1. This is the initial Office action based on the 10/594,592 application filed 28 September, 2006.
2. The preliminary amendment filed 28 September, 2006 has been entered and fully considered.
3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.
4. Claims 1-14 canceled.
5. Claims 15-28 are pending and have been fully considered.

### ***Drawings***

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "13" has been used to designate both high pressure compression units and gases. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be

notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "14" has been used to designate both high pressure compression units and gases. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

8. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: reference sign 10 at page 9 line 13. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of

an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

9. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: HP1 and HP2 at figure 1. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Claim Objections***

10. Claims 21 and 22 objected to because of the following informalities:

Claims 21 and 22 use the phrase wherein the compressed gas to be used as driving fluid is taken **below** the compressor is indefinite. The phrase is indefinite as to where the driving fluid taken below the compressor refers to the driving fluid taken at the last compressor in a series of compressors or if the phrase refers the driving fluid taken from a location on a single compressor. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 15-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over SANDS et al. (US 4,778,443) in view of AAREBROT et al. (WO 2000/011313), HOLM (US 3,075,918) and LAGRONE (US 4,339,917).

For instant **claims 15-19**, SANDS et al. teaches at the abstract, column 6 lines 1-40, figure 1 and claim 1 delivering the gas/oil/water (fluid) from the offshore facility (field) to a high pressure gas/liquids separation stage.

Also for instant **claims 15-19**, SANDS et al. teaches at the abstract, column 6 lines 1-40, figure 1 and claim 1 where the gas/oil/water (fluid) is split into a gas phase substantially consisting of petroleum gases (light hydrocarbon).

Additionally for instant **claims 15-19**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1, oil/water (two liquid phases) one of which mainly consists of water, the other substantially of oil (hydrocarbon liquids).

In addition for instant **claims 15-19**, SANDS et al. does not teach delivering the light hydrocarbon gases, separated in the high pressure separation stage, to a reinjection gas compression unit having at least two compression stages. AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C<sub>1</sub>-C<sub>5</sub>). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

Also for instant **claims 15-19**, SANDS et al. does not specifically teach delivering, **after heating**, the hydrocarbon liquid separated in the high pressure stage of separation to one or more further stages of gas/liquids separation operating at decreasing pressures. But for instant claim 15, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1, delivering the oil (hydrocarbon liquid) separated in the high pressure stage of separation to one or more further stages of gas/liquids

separation operating at medium-pressure and low-pressure (decreasing pressures). It would have been obvious to one having ordinary skill in the art at the time the invention was made to heat the hydrocarbon liquid, since it was known in the art that heating of petroleum oil (hydrocarbon liquid) provides the benefit of causing the dissolved carbon dioxide to be desorbed from the petroleum oil to help in flashing off the carbon dioxide from the hydrocarbon oil as taught by HOLM at column 2 lines 35-50.

Furthermore for instant **claims 15-19**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 where, in each stage, the oil and water with dissolved gas (liquid) is split into a gas phase essentially consisting of petroleum gases (light hydrocarbon), and oil/water (two liquid phases) one of which mainly consists of water, the other mainly of oil (hydrocarbon liquids).

What's more for instant **claims 15-19**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 delivering to a centrifugal countercurrent liquid/liquid contactor (water treatment section) the water separated both in the first high pressure separation stage and in the medium-pressure and low-pressure (decreasing pressures) separation stages.

Still more for instant **claims 15-19**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 delivering the petroleum gases (light hydrocarbon), which have



been separated in the medium-pressure and low-pressure (decreasing pressure) separation stages to corresponding compression units (5 and 6) to recompress the gases.

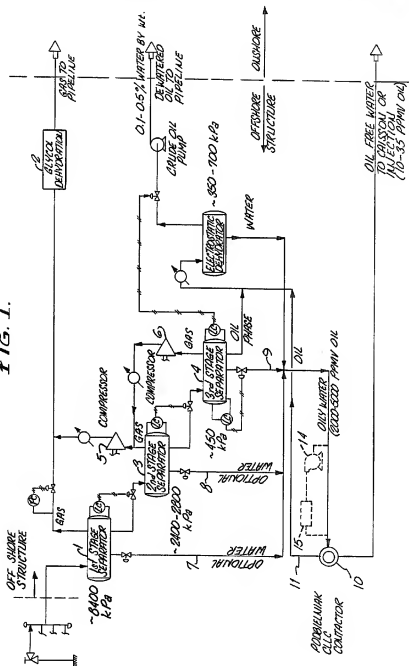
As well for instant **claims 15-19**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 using compressors (5 and 6) to compress gases, except SANDS et al. does not specifically teach **(1)** the ejector type of compressor, and **(2)** the compressed gas exiting from the last (one of) compression stages of the reinjection gas compression unit as the driving fluid of each single ejector. It would have been obvious to one having ordinary skill in the art at the time the invention was made to **(1)** use ejectors as the type of compressor, since LAGRONE teaches at column 1 lines 5-30 that such a modification would improve the suction capabilities of a fluid delivery system over other similar pumps (compressors).

Also for instant **claims 15-19**, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 **(2)** the compressed gas exiting from the last (one of) compression stages of the centrifugal pump (compression unit) as the fluid directed to (driving fluid) the ejector. AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas compression unit as discussed above for the obviousness to one of ordinary skill in the art of in order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, the (compression unit) taught by LAGRONE is similar to the

compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 the reinjection gas compression unit produces exhaust.

For instant **claims 15-19**, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combining the prior art elements according to the known technique taught by LAGRONE to the base device taught by SANDS et al. and AAREBROT et al. in order to provide the predictable result of improving the suction capability of a fluid delivery system as taught by LAGRONE at column 1 lines 15-25.

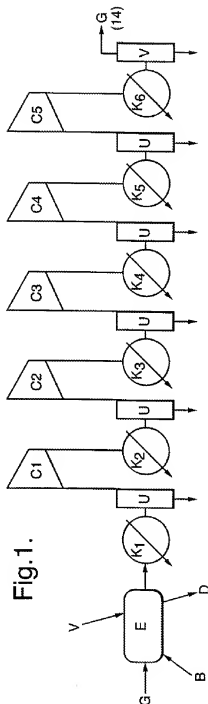
fig. 1.



WO 00/11313

1/2

PCT/NO99/00262



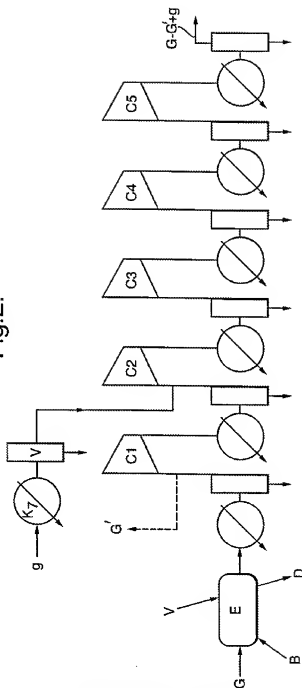
SUBSTITUTE SHEET (RULE 26)

WO 00/11313

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2/2

Fig. 2.

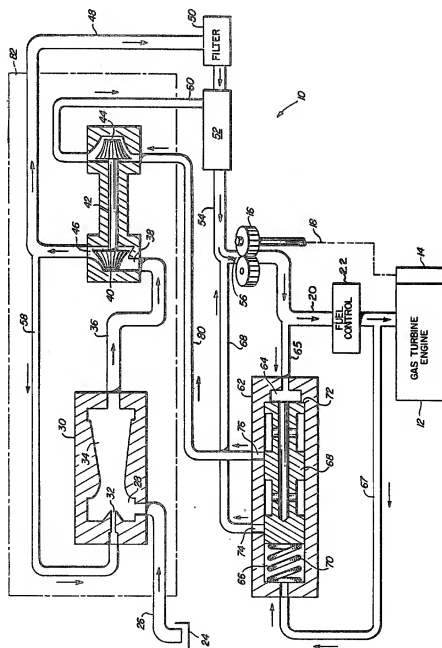


SUBSTITUTE SHEET (RULE 26)

U.S. Patent

Jul. 20, 1982

4,339,917



For instant **claim 20**, SANDS et al. does not teach wherein each stage of compression of the reinjection gas compression unit comprises at least a biphasic separator to remove liquid particles, a compressor, and a heat exchanger to cool the compressed gas. But, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, page 2 lines 25-32, figure 1, and figure 2 wherein each stage of compression ( $C_1$ - $C_5$ ) of the reinjection gas compression unit comprises at least a condensed water separator (biphasic separator to remove liquid particles)(U), a compressor ( $C_1$ - $C_5$ ), and a intercooler (heat exchanger)( $K_2$ - $K_6$ ) to cool the compressed gas. It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claims 21 and 22**, SANDS et al. does not teach wherein (1) the compressed gas to be used as driving fluid is taken below the compressor (2) before the cooling heat exchanger. But, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 wherein the compressed gas to be used as directed fluid (driving fluid) is taken below the centrifugal pump (compressor). AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas compression unit as discussed

above for the obviousness to one of ordinary skill in the art of in order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, the (compression unit) taught by LAGRONE is similar to the compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 the reinjection gas compression unit produces exhaust.

For instant **claims 21 and 22**, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combining the prior art elements according to the known technique taught by LAGRONE to the base device taught by SANDS et al. and AAREBROT et al. in order to provide the predictable result of improving the suction capability of a fluid delivery system as taught by LAGRONE at column 1 lines 15-25.

For instant **claims 21 and 22**, it would have been obvious to one having ordinary skill in the art at the time invention was made to wherein the compressed gas to be used as driving fluid is taken below the compressor (2) before the cooling heat exchanger, since it has been held that rearranging parts of an invention involves only routine skill in the art. (MPEP 2144.04 VI-C)

For instant **claim 23**, SANDS et al. does not teach wherein the reinjection gas compression unit includes three compression stages. But, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, page 2 lines 25-32, figure 1, and figure 2 wherein the reinjection gas compression unit includes



three compression stages ( $C_1$ - $C_3$ ). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 24**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 wherein the last stage of separation at decreasing pressures is performed at 450 kPa (pressure). SANDS et al. does not teach the last stage of separation at decreasing pressures is performed at sub-atmospheric pressure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the last stage of separation at decreasing pressures is performed at sub-atmospheric pressure, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (MPEP 2144.05 PART II-A)

For instant **claim 25**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 wherein the recompressed gases exiting from the compression units (5 and 6) are used as petroleum gas to a pipeline (fuel gases).

For instant **claim 26**, SANDS et al. does not teach wherein the recompressed gases exiting the compression units are sent to the reinjection gas compression unit. AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages ( $C_1$ - $C_5$ ). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 28**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 the system is performed in a floating production unit.

13. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over SANDS et al. (US 4,778,443) in view of AAREBROT et al. (WO 2000/011313) and LAGRONE (US 4,339,917).

For instant **claim 27**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 a treatment system for gas/oil/water (fluid) originating from an oil field,

a high pressure separator and at least a second lower pressure (medium-pressure) separator.

For instant **claim 27**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 petroleum (oil) associated gases. Except, SANDS et al. does not teach one reinjection gas compression unit having at least two compression stages. But, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages ( $C_1$ - $C_5$ ). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 27**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 at least a compression unit (5 and 6). For instant **claim 27**, SANDS et al. does not teach at least a compression unit equipped with a suitable ejector. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use ejectors as the type of compressor, since LAGRONE teaches at column 1 lines 5-30 that such a modification would improve the

suction capabilities of a fluid delivery system over other similar pumps (compressors).

### ***Conclusion***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY SHUMATE whose telephone number is (571)270-5546. The examiner can normally be reached on M-Th 9-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571)272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A.S./  
Examiner Art Unit 1797

/Duane S. Smith/  
Supervisory Patent Examiner, Art  
Unit 1797  
11-19-08